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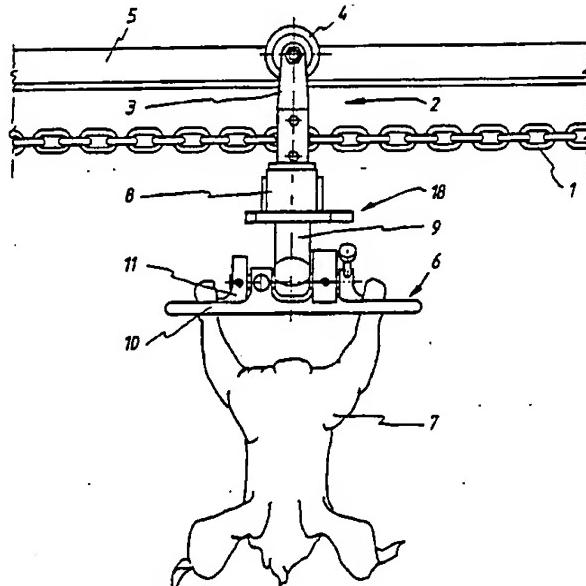


## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(54) Title: DEVICE AND PLANT FOR CONVEYING SLAUGHTERED ANIMALS, IN PARTICULAR BIRDS



## (57) Abstract

Device for conveying slaughtered animals or a part thereof. The device comprises a number of carriers (6), each of which is connected by way of adjustable connecting means (18) to a trolley of a conveyor and runs through a route past at least one inspection or processing station. The carrier comprises accommodating means (10) with accommodating elements (13) for accommodating the legs of the slaughtered animal. Fixing means (11) interacting with the accommodating elements enclose the legs like a ring.

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Device and plant for conveying slaughtered animals, in particular birds.

The invention relates to a device for conveying slaughtered animals, in particular birds, or a part thereof, which device comprises a number of carriers, each of which is connected by way of connecting means 5 to a conveyor and runs through a route past at least one inspection or processing station, the carrier comprising means for accommodating the slaughtered animal, and also fixing means which interact in such a way with the accommodating means that the accommodated 10 slaughtered animal is fixed relative to the accommodating means.

Such a device is known from Spanish Utility Model 183,766 in the name of Stork Inter Iberica S.A. The pair of brackets described therein, which serve as 15 accommodating and fixing means for the legs of slaughtered birds, have the disadvantage that the fixing of the legs by the second bracket in the slightly droplet-shaped bottom ends of the first bracket does not constitute a stable fixing. In the 20 course of certain processing operations to be carried out on the bird, the bird can be lifted up slightly. There is also a risk that one or both legs will be released from the bracket.

The object of the present invention is to overcome 25 this disadvantage by providing a device which does guarantee fixing of the legs in the carrier.

This object is achieved in the present invention through the fact that the accommodating means are provided with at least two accommodating elements for 30 accommodating the legs of the slaughtered animal, and the fixing means are designed so that, interacting with the accommodating elements, they essentially enclose the legs like a ring.

In an advantageous embodiment the accommodating

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elements extend essentially horizontally when accommodating the legs. This embodiment has the advantage that the slaughtered birds can be accommodated simply in the carrier in a way such as 5 that described e.g. in US Patent Specification 4,178,659 of applicants.

In a further embodiment the accommodating means are formed by an essentially elongated, plate-shaped element. This has the advantage that the accommodating 10 means can be used in a production line such as that described in European Patent Specification 0,159,731 in the name of applicants. The carriers of the device are in this case guided along the guides 6 mentioned in the patent specification, so that a very stable suspension 15 of the animal is ensured during conveyance.

The invention also relates to a device for conveying slaughtered animals, in particular birds, or a part thereof, which device comprises a number of carriers, each of which is connected to a conveyor by 20 way of adjustable connecting means and passes through a route past at least one inspection or processing station in such a way that during operation of the conveyor the carrier at a predetermined place on the route is rotatable about an essentially vertical axis, 25 for which purpose the connecting means have two or more arms which project at right angles to the direction of conveyance and can interact with one or more arm operating elements disposed along the route.

Such a device is described in European Patent 30 Application with publication number 86700 in the name of Etablissements Bourgoin.

This device has the disadvantage that it is not possible to turn series of carriers with differing angular orientations in the same, known direction.

35 The object of the invention is to overcome this disadvantage by providing the possibility of making all carriers take up the same initial position prior to a processing operation.

This is achieved by a device of the type

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described above, of which at least one of the arms is a length which differs from that of the other arms.

The invention also relates to a device for conveying slaughtered animals, in particular birds, or 5 a part thereof, which device has a number of carriers, each of which is connected by way of adjustable connecting means to a trolley of a conveyor and passes through a route past at least one inspection or processing station in such a way that during operation 10 of the conveyor the carrier at a predetermined place on the route is rotatable through a predetermined angle relative to the trolley about an essentially vertical axis.

Such a device is known from European Patent 15 Application 86700.

With the known device it is not possible to disregard certain processing operations along the route of the conveyor. Nor is it possible, for example, to make a choice between two processing machines disposed 20 on either side of the route.

The object of the invention is to overcome these disadvantages through the fact that the carrier is set up eccentrically relative to the trolley. The invention provides the possibility of taking the 25 slaughtered birds into or out of the working range of a processing machine along the route by rotating the carrier. One may thus avoid using parallel transport tracks for processing animals in different ways. The processing equipment can be used more efficiently in 30 one single transport track, processing each animal in a specific manner by selecting the equipment to be used and to be avoided. Other means of moving the carrier with respect to the trolley can also be used, such as a connecting means that is a controlled pendulum and can 35 swing sideways with respect to the direction of transport.

The invention also relates to a plant for conveying slaughtered animals, in particular birds, or parts thereof, past at least one inspection or

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processing station, comprising a conveyor for moving a number of trolleys along a predetermined route, to which trolleys a carrier for a slaughtered animal or the like is connected by way of adjustable connecting means, while the connecting means comprise two or more arms which project at right angles to the direction of conveyance and which can interact with an arm operating element disposed at a predetermined place along the route for turning the carrier through a predetermined angle relative to the corresponding trolley.

A disadvantage of the known plants is that they are designed to carry out a fixed series of processing operations on the bird; they are not capable of adapting the processing range depending on certain characteristics of the bird.

This disadvantage is overcome by a plant according to the invention which is characterised by one or more recording stations disposed along the route, for recording one or more parameters concerning the slaughtered animals or the like being conveyed past the recording stations, and arm operating element control means for controlling the position of one or more arm operating elements on the basis of the data recorded at the recording stations, in such a way that said elements interact or otherwise with the arms of the connecting means.

These and further features of both the device and the plant will be explained in further detail with reference to the drawings, in which:

Fig. 1 shows a short section of the conveyor;

Figs. 2A and 2B show top views, partially in cross-section of a closed and open carrier respectively of the conveyor of Fig. 1;

Fig. 3 shows three carriers of the conveyor disposed one after the other, in different positions along the route;

Fig. 4 shows a device from Fig. 1 turned through 90°; and

Fig. 5 shows schematically in top view the

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interaction between a Maltese cross in the connecting means and arm operating elements disposed along the route.

Fig. 6 shows schematically in top view a processing station for cutting wings of poultry, which is adapted for coöperation with the device for conveying slaughtered poultry.

The conveyor shown in Fig. 1 is formed by a driven chain conveyor 1, provided with trolleys 2 which in a usual manner comprise a fork-shaped element 3 with wheels 4. The wheels 4 are guided along a rail 5, the shape of which determines the route of the conveyor. This route runs in the usual way through one or more processing or inspection stations (not shown). Each trolley 2 is provided with a carrier 6, which is suitable for accommodating a slaughtered animal, here a slaughtered bird 7, or a part thereof, and carrying it along the route of the conveyor. Each carrier 6 is fixed by way of adjustable connecting means 8 to the corresponding trolley 2. These connecting means 8 make it possible for each carrier 6 during operation to be rotatable through a predetermined angle on a vertical axis.

It can be seen in Fig. 2 that a carrier 6 is made up of a bearing element 10 and a shut-off device 11, which can pivot relative to each other and relative to the connecting means 8 about an axis 12. The bearing element 10 is provided with two recesses 13, in which the legs of the bird 7 can be accommodated. These recesses 13 have such dimensions that the bird 7 can hang by its tarsal joints. A virtually closed ring, in which the tarsal joint is securely confined, is produced by closing shut-off device 11. The carrier 6 also has two carrier control levers 14, 15, which can produce the rotation of the bearing element 10 and the shut-off device 11 about the axis 12.

Fig. 3 shows how the two carrier control levers 14, 15 interact with guides 16 fitted on a wall (not shown) lying above the plane of the drawing, which

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interaction will be described below. In order to guarantee good stability in the directions at right angles to the direction of conveyance, the connecting means 8 are guided during operation of the levers 14, 5 15 between two parallel walls 17 running parallel to the conveyor chain 1, only one of which is shown in the figure.

The lefthand device of the three devices illustrated here shows a carrier 6, in the closed position, 10 in which carrier a bird 7 is hanging by the legs. This situation is identical to that shown in Fig. 1. When the chain conveyor 1 moves to the right in the drawing, the carrier control lever 15 at a given moment comes into contact with guide 16, and said lever will be forced downwards as a result of this intersection, thus 15 opening the shut-off device 11. The carrier assembly will assume the position shown in the centre of Fig. 3 when the slope of the guide 16 ends.

In the carrier on the right in the figure it can be seen how the shut-off device 11 closes again 20 when the carrier control lever 15 goes against a rising guide (groove) 16 on moving further to the right. As a result of this the shut-off device 11 closes again.

The discharging (not shown) of the bird 7 can 25 take place by forcing the carrier control lever 14 upwards when the shut-off device 11 is open, causing the recesses 13 to be directed with their openings downwards, as a result of which the bird 7 can be discharged from them.

Fig. 4 shows a carrier 6 which is turned 30 through 90° relative to the carrier from Fig. 1. The figure shows clearly that the carrier 6 is disposed eccentrically relative to the trolley, which makes it possible to bypass or actually seek the working range 35 of certain processing machines disposed along the route.

In order to be able to rotate the carrier 6 about a vertical axis, the connecting means 8 are provided with a Maltese cross 18 (Fig. 5) which

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interacts with arm operating elements 19 fitted at the bottom of the wall 17, and in the case of which the wall 17 acts as a guide for the connecting means. The rotation of the carrier 6 is determined by the  
5 interaction between a segment of the Maltese cross, and also by the angular orientation fixing means present (not shown) in the connecting means 8.

Fig. 5 shows that the segment with the smallest radial dimensions passes the three arm operating  
10 elements 19 undisturbed. It will be clear that no matter what the initial position of the Maltese cross 18 is, after the three arm operating elements 19 have been passed, the cross always takes up the same position, which is advantageous for then making a  
15 processing selection.

When a selection of a processing operation on the animal is being made, after said animal has been checked for certain characteristics by a recording station, it is possible with the aid of the result of  
20 the check to operate the arm operating elements 19, so that an angular orientation to be achieved by the carrier 6 can be selected. In the same way it is possible to have a processing station bypassed by the carrier 6, through the fact that as a result of its  
25 eccentric position outside the working range of the processing station in question the carrier passes said station, as can be seen in Fig. 6.

Fig. 6 shows schematically in top view a processing station 101 for cutting wings of slaughtered  
30 poultry. Slaughtered poultry 105 is carried by a device according to the invention (not shown) along a transport track 100 of a conveyor (not shown). By means of an excentrical set up of the carrier relative to the trolley, the poultry can be brought both in position A  
35 and in position B.

The processing station consist basically of a frame 102, ratary driven cutting devices 103 for cutting the wrings of poultry and wing guide bars 104 for guiding the wrings of poultry so that they may take

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a proper position when being cut.

Also, the frame 102 carries a guide bar 106.

- The guide bar 106 will act on the poultry which is forwarded, in position B by guiding it sideways outside  
5 the working range of the processing station 101. After detouring the processing station the poultry will be guided back into its original position close to the transport track 100.

- On the other hand, poultry in position A will  
10 not be bothered by guide bar 106 and may proceed into the working range of the station 101. The guide bar 106 is provided at its foremost end with a small rotatable wheel 107 for making an easy deviation between poultry in position A and poultry in position B.

CLAIMS

1. Device for conveying slaughtered animals, in particular birds, or a part thereof, which device comprises a number of carriers, each of which is connected by way of connecting means to a conveyor and runs through a route past at least one inspection or processing station, the carrier comprising means for accommodating the slaughtered animal, and also fixing means which interact in such a way with the accommodating means that the accommodated slaughtered animal is fixed relative to the accommodating means, characterised in that the accommodating means (10) are provided with at least two accommodating elements for accommodating the legs of the slaughtered animal (7), and the fixing means (11) are designed so that, interacting with the accommodating elements, they essentially enclose the legs like a ring.
2. Device according to claim 1, characterised in that the accommodating elements extend essentially horizontally when accommodating the legs.
- 20 3. Device according to claim 1 or 2, characterised in that the accommodating means (10) are formed by an essentially elongated, plate-shaped element.
4. Device according to claim 3, characterised in that the accommodating elements are formed by the edge 25 of the plate-shaped element around recesses (13) which have been provided, and which are of such dimensions that the slaughtered animal (7) can be suspended therein by the tarsal joints, and these recesses (13) interact in such a way with the fixing means (11) that when fixing takes place the recesses (13) are at least 30 almost fully shut off.
5. Device according to claim 4, characterised in that the respective two recesses (13) are disposed near the ends of the elongated element (10).
- 35 6. Device according to one of claims 3 - 5, characterised in that the fixing means (11) pivot about

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an axis (12), parallel to the carrier (6).

7. Device according to claim 6, characterised in that the accommodating means (10) also pivot about the axis (12).

5 8. Device according to one of the preceding claims, characterised in that at both ends of the elongated element (10) means are disposed for interaction with two parallel guide tracks, between which the carrier (6) can be moved along in a linear manner.

10 9. Device for conveying slaughtered animals, in particular birds, or a part thereof, which device comprises a number of carriers, each of which is connected by way of adjustable connecting means to a conveyor and runs through a route past at least one inspection or processing station in such a way that during operation of the conveyor the carrier at a predetermined place on the route is rotatable about an essentially vertical axis, for which purpose the connecting means have two or more arms which project at right angles to the direction of conveyance and which can interact with one or more arm operating elements disposed along the route, characterised in that at least one of the arms is a length which differs from that of the other arms.

15 10. Device according to claim 9, characterised in that the connecting means (8) comprise a Maltese cross (18) with four segments which are separated from each other by grooves.

20 11. Device according to claim 10, characterised in that three segments have larger radial dimensions than the remaining segment.

25 12. Device for conveying slaughtered animals, in particular birds, or a part thereof, which device comprises a number of carriers, each of which is connected by way of adjustable connecting means to a trolley of a conveyor and runs through a route past at least one inspection or processing station in such a way that during operation of the conveyor the carrier at a predetermined place on the route is rotatable about an

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essentially vertical axis through a predetermined angle relative to the trolley, characterised in that the carrier (6) is disposed eccentrically relative to the trolley (2).

5 13. Plant for conveying slaughtered animals, in particular birds, or parts thereof, past at least one inspection or processing station, comprising a conveyor for moving a number of trolleys along a predetermined route, to which trolleys a carrier for a slaughtered animal or the like is connected by means of adjustable connecting means, while the connecting means comprise two or more arms which project at right angles to the direction of conveyance and which can interact with an arm operating element disposed at a predetermined place 10 along the route for turning the carrier through a predetermined angle relative to the corresponding trolley, characterised by one or more recording stations disposed along the route, for recording one or more parameters concerning the slaughtered animals (7) 15 or the like being conveyed past the recording stations, and arm operating element control means for controlling the position of one or more arm operating elements (19) on the basis of the data recorded at the recording stations, in such a way that said operating elements 20 interact or otherwise with the arms of the connecting means (8).

14. Plant according to claim 13, characterised in that at least one of the arms is a length which differs from that of the other arms.

30 15. Plant according to claim 13 or 14, characterised in that the connecting means (8) comprise a Maltese cross (18) with four segments which are separated from each other by grooves.

16. Plant according to claim 15, characterised in 35 that three segments have larger radial dimensions than the remaining segment.

17. Plant according to one of claims 13 - 16, characterised in that the carrier (6) is disposed eccentrically relative to the trolley (2).

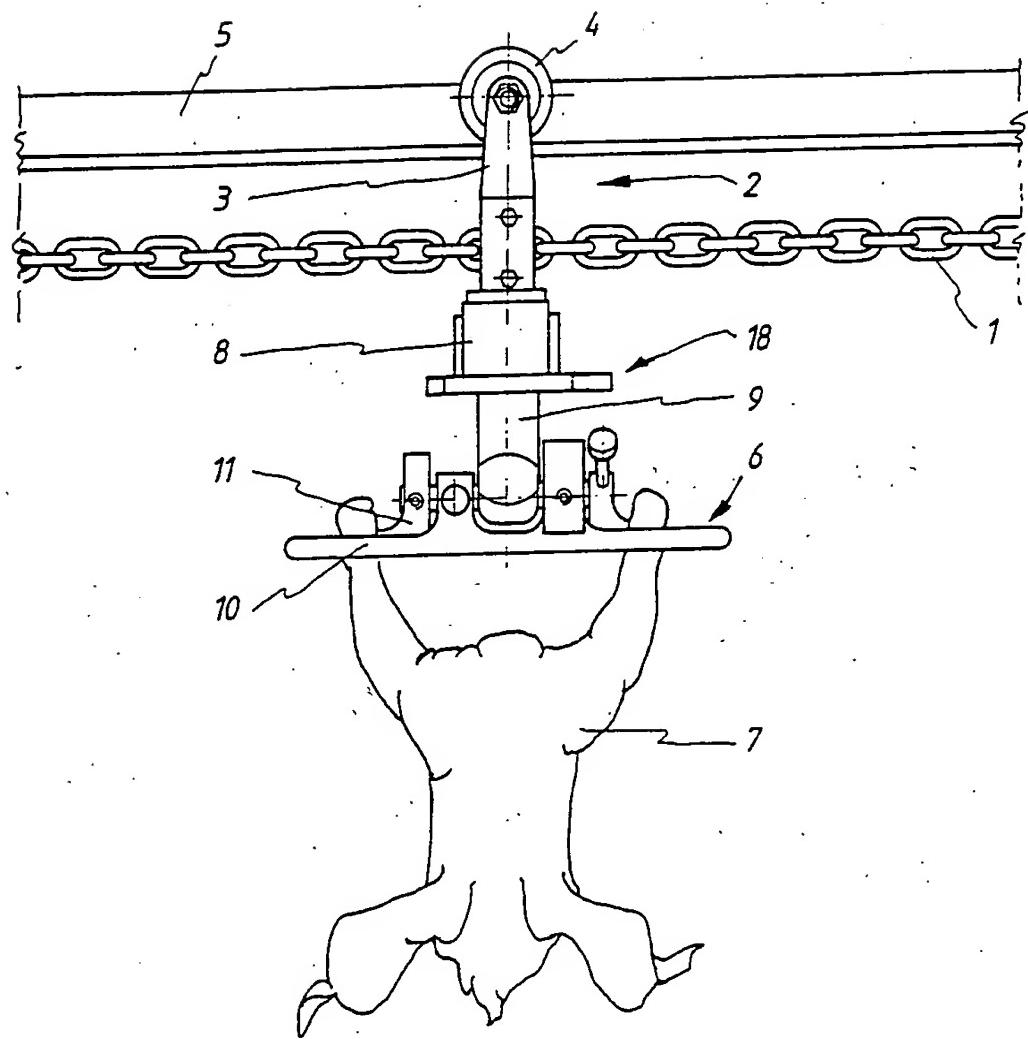
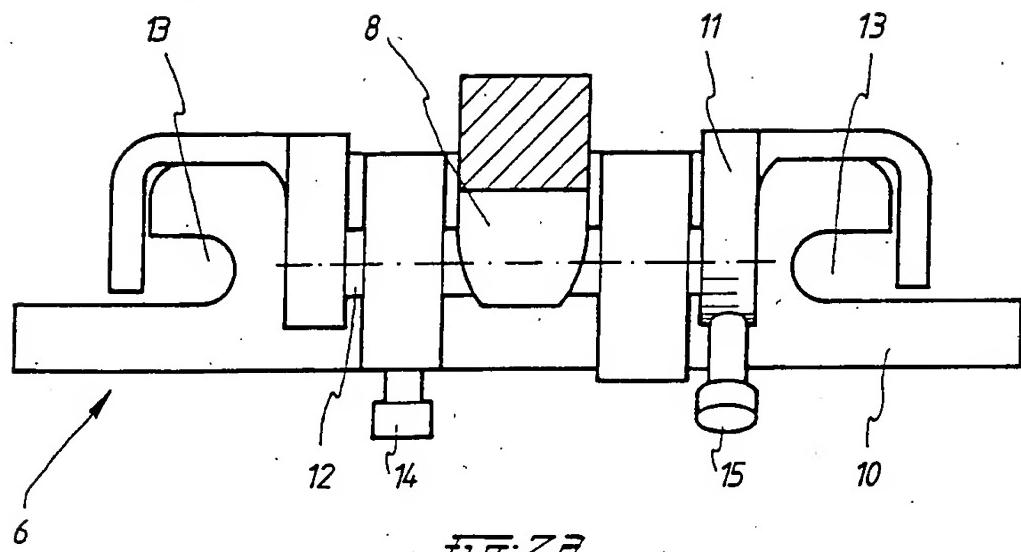
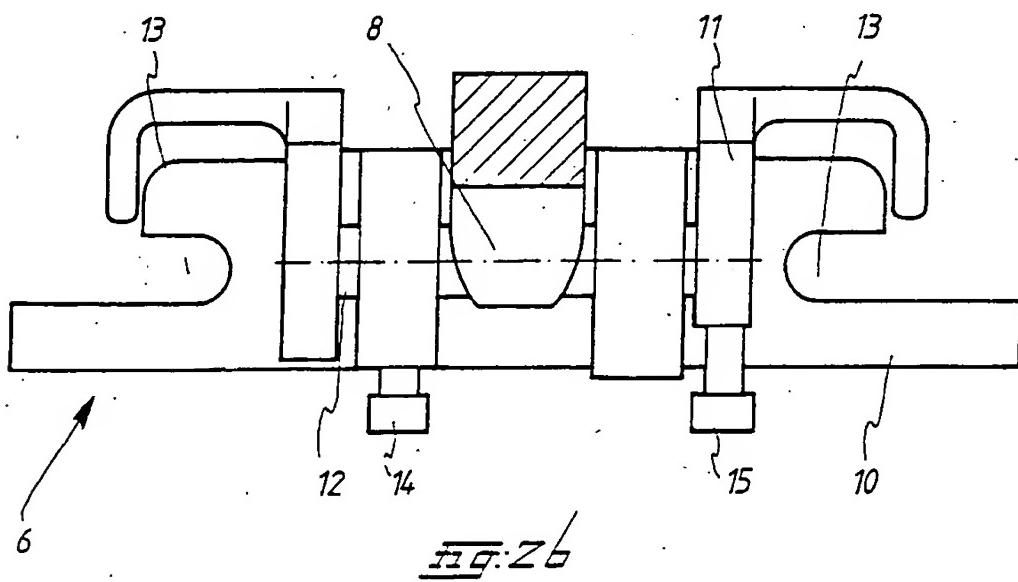
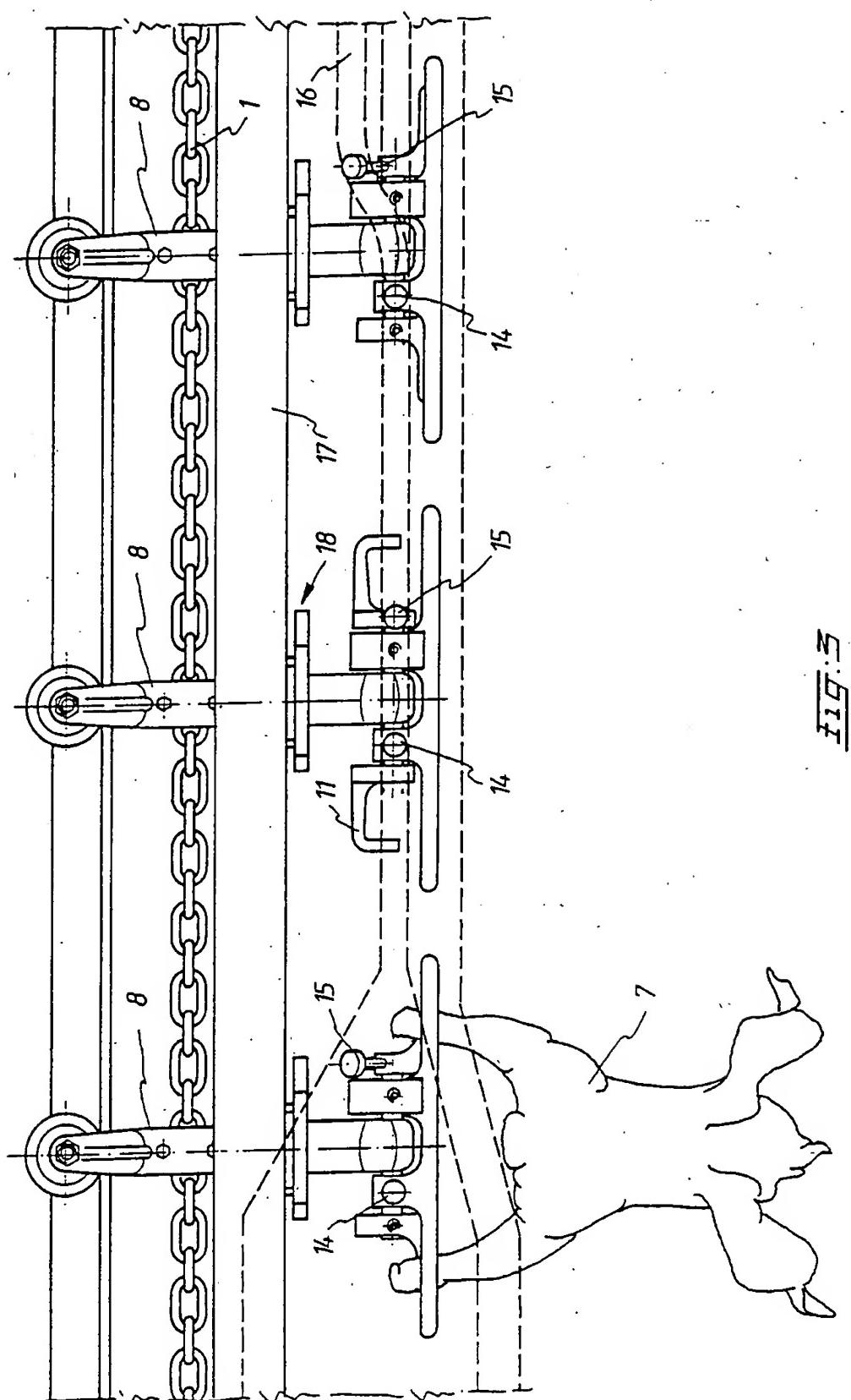


FIG: 1

fig.ZBfig.ZD



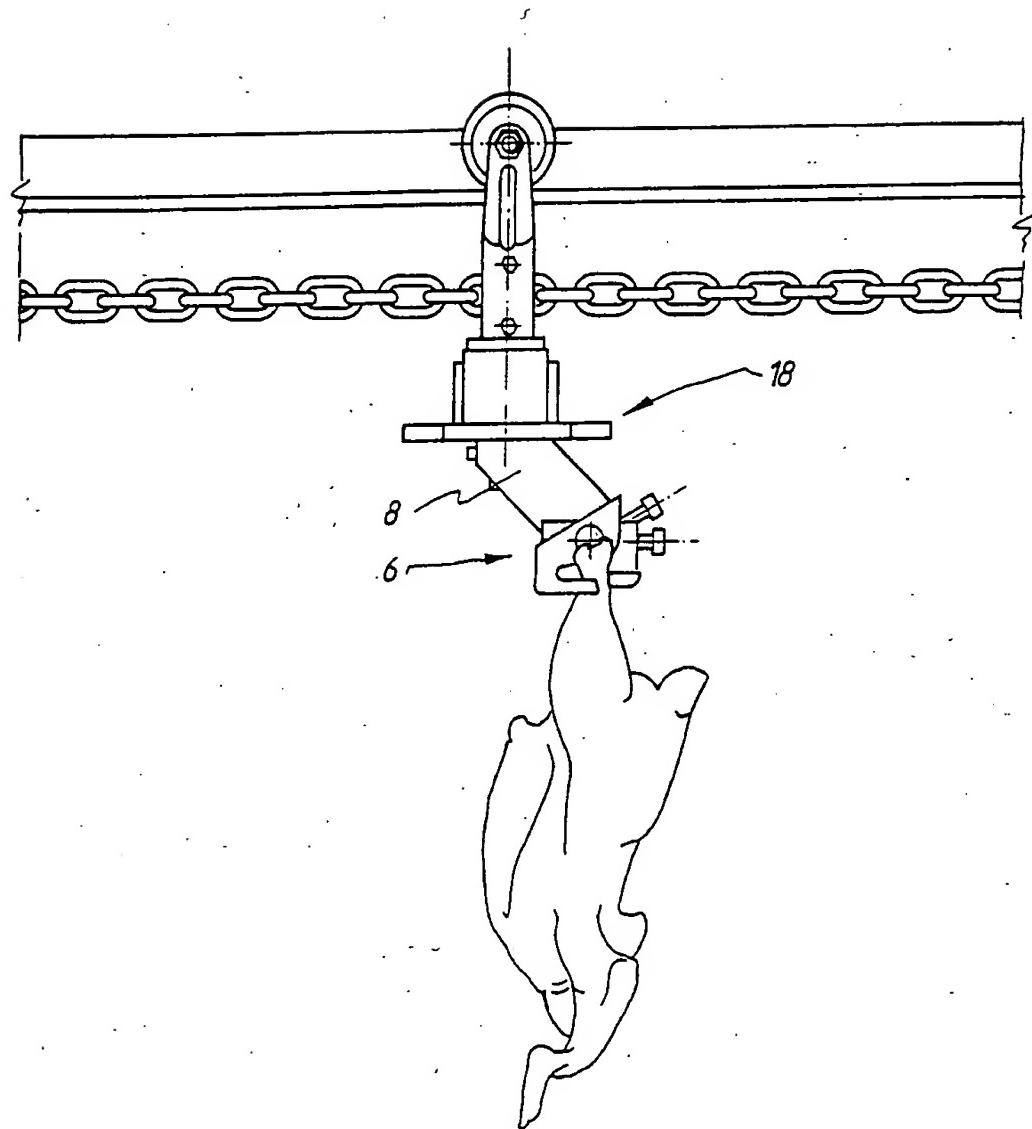
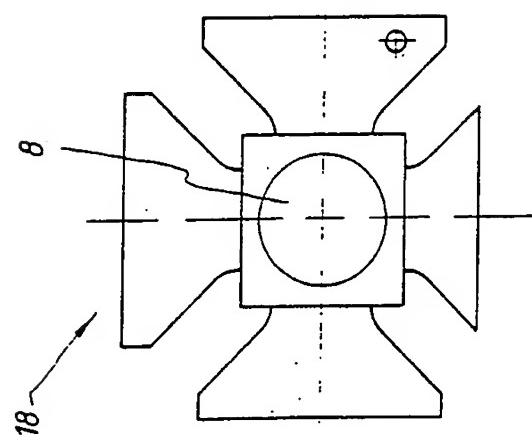
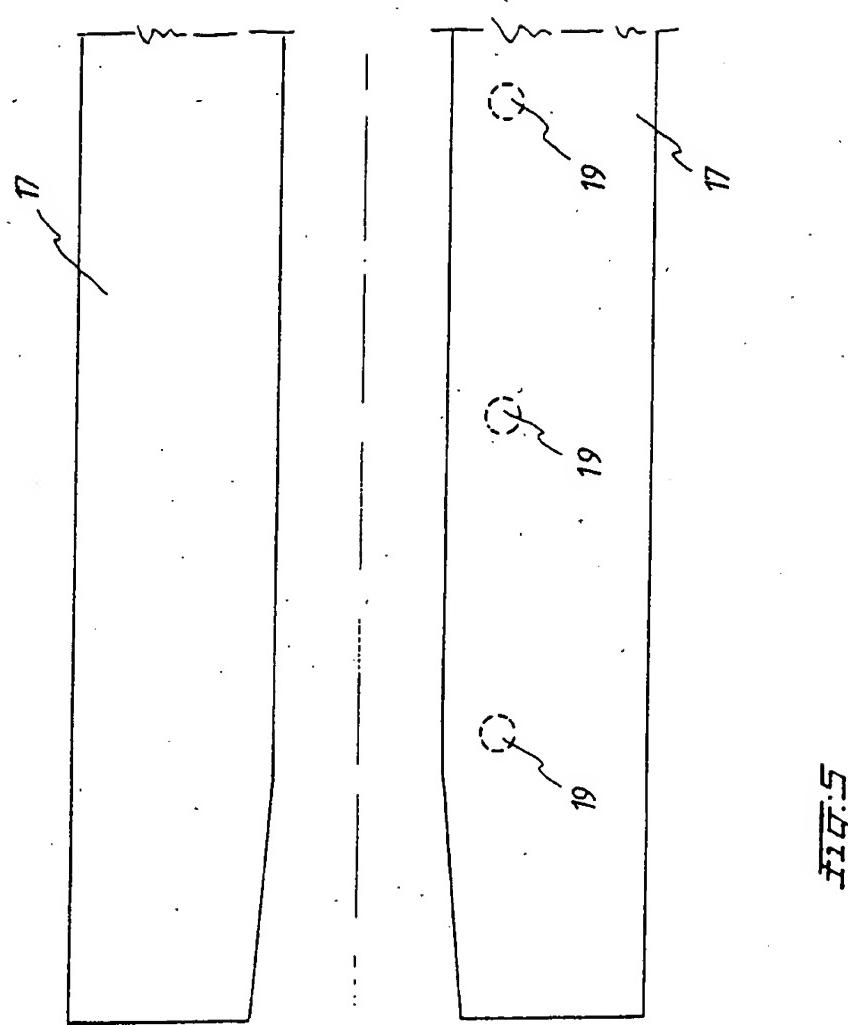
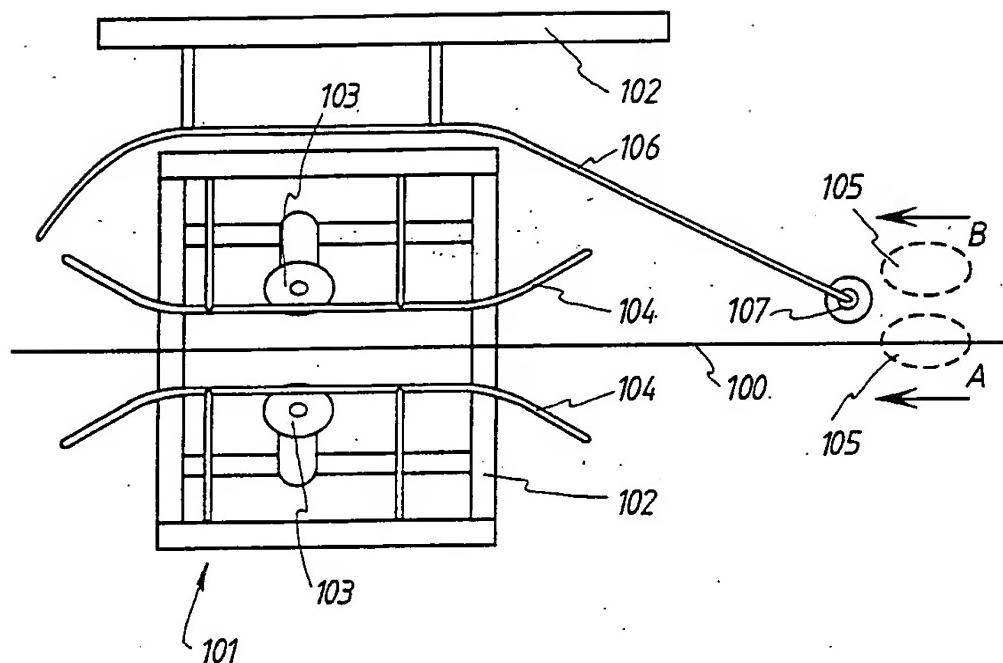


FIG:4





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